Applications for First Derivatives.  
Name_________________________

For the function $f(x) = \frac{e^x}{1 + x}$ answer the following questions:

1. Is this a rational function? Why or why not.

2. For what value of x is this function undefined?

3. The derivative of this function is _______________________

4. This derivative of this function is positive on the intervals ___________________,
   and therefore the function is increasing on the intervals ________________.

5. The derivative of this function is negative on the intervals ________________,
   and therefore the function is decreasing on the intervals ________________.

6. Find the equation for the line tangent to the graph of $y = \frac{1}{1 + x^2}$ at $(-1, \frac{1}{2})$.

7. Find the equation for the line tangent to the graph of $y = \frac{x}{1 + x^2}$ at $(3, 3)$.